An
Inaugural Dissertation
on
Trachitis
For
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of
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By
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Trachitis or Croup.

The diseases of children have been too much over-looked, to the great regret of those who have the management of them; and in consequence of this, they have been but superficially understood, both as regards their pathology and treatment. Very little attention was paid to the investigation of the diseases of this important branch, until within this last century. At present, however, the diseases of childhood receive a due attention from some of the most respectable practitioners of medicine; and as a reward of their labours, they see many of the diseases of children, which a short time ago, were considered intractable, and beyond the resources of our art, now yielding readily to their prescriptions. With these impressions, I have selected the above mentioned disease, as a subject of my inaugural thesis.

History.

Trachitis is one of the most frequent, as well as most alarming diseases, that is found in the catalogue of the affections incident to children. It is defined an inflammatory affection of the larynx and trachea. It is generally confined to the period of early life. The most usual time is between the first and fifth year. It seldom attacks infants according to Cullen until they are weaned: after this time, the younger they are the more obnoxious are they to its attack. This, as a general rule, may be correct: but it is well known, that children have it at every period from the first to the fifth year. Neither situation nor climate gives security against this disease. The predisposition to it is found to exist in every situation; in the city and country; high and low lands; along the sea coast, as well as in the interior. Cullen says there are no instances of persons being attacked above the age of twelve years. To the incorrectness of this idea, I can testify from my own limited observation, in a case where a female,

twenty years of age, was attacked without any precursory symptoms, with difficult respiration, stridulous cough and such other phenomena as mark the disease. Besides, all the later writers inform us to the contrary; for they tell us that adults, from almost any slight exposure will have renewals of the attack. Very young children are sometimes seized with this complaint; but it is of rare occurrence. Professor Chapman related cases of two females who had the disease frequently: their children were also liable to it. From this, he infered that certain constitutions are more easily wrought upon than others: and hence the disease is more aft to occur in particular families. Dr Cheyne accounts in this way for the disease occurring so seldom after puberty. He states, that at this period of life there is a great change in the constitution of the patient, and especially at the upper part of the windpipe. This is every way plausible, as at this period of life there is an alteration of voice which daily observation proves: therefore we cannot, I think, hesitate to infer that there

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alterations in structure render these parts able to resist morbid aggressions. The same cause still operating, other parts of the tissue are affected, and a new train of symptoms is the consequence. Weak and debilitated children, who are not exhausted with some other disease, are not prone to this; although, in some instances, they fall victims to it. The children most liable to be attacked, are those of a ruddy complexion, and predisposed to fatness, prior to the second year.

Causes.

These are sufficiently obvious, when we take into consideration the season of the year at which it generally makes its appearance. Contagion was for some time considered as a cause; this has of late been, deservedly, lost sight of. A late writer observes that there can be no ground for supposing this an infectious disease. He would as readily believe that an inflammation of the Brain or Plema should be thus communicated as an inflammation of the membrane lining the trachea;

and believes that it may be safely asserted, the fact is otherwise. Of children who have slept together, one will take it and the other escape: now had the disease been really contagious, this would not have happened. When several children of a family have it at the same time, it is no proof of the disease being communicated from one to another: but that they are exposed to the same causes: and when the same predisposition exists the same con-sequences will follow; hence it may operate as well on one as on the other. It sometimes prevails epidemically. It is stated to have occurred in the town of Leith, not far distant from Edinburgh, to such a degree, that nearly all the children were affected; and it was with great difficulty they could be raised. The most frequent cause is cold; hence we see the disease so frequently in the spring and fall, during the sudden transitions from heat to cold. It acts by repelling perspiration to some of the internal parts, viz: the mucous membrane of the larynx and trachea; from the great susceptibility

that exists in this tissue to be affected at these seasons of the year, and at this period of life. It is frequently met with along large collections of water and in sea port towns where the air is damp and moist. It is stated to be very prevalent in cold and changeable weather: this is exemplified by its occurring more frequently in the northern part of Europe than in the more temperate regions. To the causes enumerated above may be added some secondary ones: such as worms and indigestible substances, which oppress the stomach, produce irritation in that organ, and secondarily the parts that are concerned in this disease. It is also said to arise from inflammation of the fauces: thus it is seen in Cynanche Tonsillaris and Scarlatina. This disease has sometimes appeared when every precaution had been taken to guard the patient against the changes of the atmosphere, by confining him to the house and keeping him warm. The child is sometimes attacked without any premonitory symptoms; and the disease runs its course so rapidly

as to terminate fatally, unless the distressing symptoms be relieved by the proper remedies.

This disease is divided into three stages: 1st, the forming stage; 2d, the completely formed stage; and 3d, the congestive stage. In this, I have followed the division of Professor Dewees.

Of the first stage.

A peculiarly hoarse cough continues through the whole disease and particularly the first stage. This hoarseness, which is the only precursory symptom that can be relied on, is perceived upon coughing. This may be distinguished from common hoarseness, or that which usually attends catarrh, by its being discovered only during coughing, in the first stage; while in the catarrh it is observed to affect the speech. In croup, the sound is more clear and distinct, resembling a sound issuing through a metallic instrument, and is not necessarily attended with a sore throat; while catarrh is almost always accompanied with it. The patient, for the most part, appears to enjoy good health in the commencement of the disease;

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he has no fever; breathes without difficulty; many times he is not diverted from his amusements; his appetite is good; and the digestive organs perform their functions regular-ly. This hoarseness, which is the only premonitory symptom, according to the observation of Professor Dewees, forewarns the friends of the approach of this unwelcome visiter. The disposition to the disease may remain dormant for some time, whilst the patient is not exposed to the exciting causes. So soon as this happens, the disease becomes devel-oped with all its alarming symptoms; and immediately demands strict attention. When catarrhal symptoms precede this disease, or in other words, when croup supervenes upon catarrh, the gentleman above mentioned consid-ers it, not a consequence but a coincidence. His reasons for so thinking are the following; 1st he considers catarrh to be owing to a peculiar condition of the nose and windpipe; and for croup to grow out of this affection, it will require an alteration of that condition, and not a mere increase of its force. 2d he has been the severest catarrhs,

which required the most prompt an active treatment, not attended with croupy symptoms as a consequence.

Of the second stage, or the completely formed stage. If proper measures have not been pursued to arrest the disease in its forming stage, we shall quickly have an aggravation of all the distressing symptoms. The cough becomes more frequent; the hoarseness is increased; and may now be observed when the patient attempts to speak; the breathing becomes more difficult; and from the violence of the cough and the difficulty of breathing the face becomes flushed and the circulation in general is much hurried: soon after this a drowsiness comes on; and from which, the child is frequently aroused by the cough, and consequent fits of suffocation: If the patient is old enough, he starts up, clings to the nearest object, and looks most piteously around him. Sometimes the circulation is but little impeded; the face will be pale; the skin and extremities even cooler than natural. But more frequently if it should not suddenly terminate fatally it passes on to what

constitutes the last stage

The third stage

Here the inflamed vessels have relieved themselves by effusion, from which a membrane is formed. This extraneous substance which lines the windpipe, renders respiration more laborious than in the two preceding stages from the great impediment to the ad mission of atmospheric air. The cough is very violent, with some expectoration of thin frothy mucus, which from its abundance clogs up the trachea. The patient now tosses to and fro with the hope of relieving himself from strangulation. The face exhibits a dark livid appearance: at the same time great anxiety is manifested with an expression of the utmost anguish. The hoarseness is neither so great nor so sonorous as in the prior stages; the lips assume a livid appearance; and if life be prolonged for a few hours more, the lividness extends down the neck; the pulse becomes small and fluttering: the heart beats with violence; and all the other symptoms denote the approach of death.

Pathology.

There is some contrariety of opinion whether this disease depends exclusively upon inflammation, or upon inflammation and spasm, either combined or existing separately. Upon this point physicians at the head of the profession disagree. Those who are in favour of spasm advance as a proof of it, that persons are sometimes attacked so suddenly, that the time would be too short for inflammation to be developed, and hence it must be spasm. This appears quite plausible, If we examine the reasons of those who are inimical to spasm, they are found to be equally cogent, and hence it behooveth me to be silent, lest I fall into error. By some it is said that the film which is found within the trachea, is inspissated mucus, being a secretion of the mucous glands which becomes thickened by the air in expiration: because it has not the characteristics of a membrane, namely; bearing maceration without having its texture destroyed: and from being found in parts destitute of mucous glands.

Therefore another source was sought for: and which now is the prevalent opinion, viz that it is an exudation from the exhalent arteries, analogous to what is found in inflammations of the internal membranes as the pleura, peritoneum &c.

Treatment
Of the first stage.

The indication, in this stage, is to remove the irritation or inflammation which causes the hoarseness: and to guard the patient against its renewal. To accomplish the first: rubefacients should be freely applied to the throat: as the spirit of turpentine, aqua ammonia, vinegar and Mustard &c. These should be removed so soon as the skin becomes pretty freely inflamed. If the hoarseness be not relieved by the first application of the rubefacients, it should be reapplied. To aid these external means in removing the irritation, an emetic should be given; the best of which is the compound syrup of squills or Professor Coxe's

Olive syrup. This must be repeated pro re nata. Tartarized antimony and Ipecacuanha have been given in combination to produce emesis: one grain of the former to six grains of the latter, is considered a medium dose for a child under the age of two years. If the bowels are costive, they are to be kept open by Calomel, Castor oil, or some laxative injection, which may be repeated as often as it is demanded. The patient must be confined to a low diet; such as barley water, toast water or flaxseed tea: he must avoid indulgences of every kind; and exposures to a damp and moist atmosphere must be especially guarded against: his throat must be protected by flannel, or some other covering. A strict adherence to the treatment proposed above must be enjoined. If one emetic will not produce a copious secretion from the larynx and trachea, it may be repeated in an hour or two: but small doses of the syrup should be administered frequently, or until this has taken place. This injunction will apply equally as well

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to the cathartics and the other remedies recommended.

The second stage.

If there is a great determination of blood to the part affected, accompanied with general febrile excitement, we must resort to the most powerful means to interrupt this determination, or divert it to some other part. With this view, the patient should be bled until a decided impression is made upon the system. A large orifice should be made in the arm, and the blood permitted to flow until syncope is produced, if relief be not obtained sooner. The quantity of blood to be taken for this purpose, should be regulated by the age and constitution of the patient, and the urgency of the symptoms. At every bleeding, we must be guided by the state of the pulse, and the impression it makes on the disease. If a single bleeding does not mitigate the symptoms, and the pulse become strong and full, after a short time we must repeat it. These will generally suffice; but should the same symptoms present themselves, that did previous to the second general venesection

We should continue general bleeding, unless some symptom indicated further general evacuation to be detrimental. By some, the jugular vein is preferred to that of a vein of the arm. The advocates for it, state 1st, from the jugular veins being always turgid, it is more easy to let blood from them than those of the arm: according to their statement, the impression made on the disease is greater. In performing the operation, Dr Jackson enjoins upon us, to make the opening at the junction, of the lower third with the upper two thirds, to avoid wounding the hypoglossal nerve. After bloodletting, if this has been necessary, we give an emetic; this is found very efficacious in removing the mucus from the trachea; it also lessens local inflammation on the principle of revulsion. The antimonial emetics are preferred: as they operate more speedily and effectually than any other. They must be repeated as often as the breathing is obstructed by the accumulation; which endangers the patient, from the great liability to suffocation.

The patient must continue, in some instances, to take Emetics for some time, in order to produce copious emesis. If the stomach be insensible, the medicine will not operate kindly; here the warm bath is found to be serviceable. It should be between 90 and 100 degrees of Fahrenheit's thermometer. If our expectations should not be realized by the warm bath, we bleed freely from the arm, if the pulse will bear it, place the patient again in a warm bath, and administer an Emetic while there. The bowels should be freely opened by some mild cathartic; this may be assisted by the occasional exhibition of clysters. Calomel seems to have the preference; and by the best authorities, it is considered an invaluable remedy. Professor Chapman recommends it in very large doses, to open the bowels and carry off the lingering symptoms. If the bowels remain inactive, after their contents have been once evacuated; a cathartic medicine, especially small and repeated doses of calomel, must be administered from time to time,

lest their contents become a source of irritation, and add fuel to the existing disease. If there is cough and difficulty of expectoration, after V.S. has been freely premised, and the inflammatory symptoms subsided in a great measure, we give some Ipic syrup, or small doses of tartrite of antimony in solution, to assist the expectoration and promote a determination to the surface. These medicines may also be employed from the very commencement, and if used sufficiently early, almost always put an end to the disease, especially when administered in conjunction with the rubefacients. When the inflammation is not altogether subdued, and the state of the system will not admit of continuing general depletion we have recourse to local means. When we use cups, they should be applied to the back of the neck, or between the shoulders: when applied over the region of the trachea they interfere very much with the function of respiration, from their pressure, and consequently produce great irritation.

Blisters are also recommended; their application should always be preceded by general ablutions.

The Third Stage.

The indications of cure, are 1st, to remove the membrane, 2dly, to produce an alteration in the condition of the inflamed surface; so as to prevent the formation of a new one. To accomplish the first indication, we give Polygala Senega in decoction; which is at present in high repute. It is stated to have surpassed in its beneficial effects, all the saline emetics. The dose of the decoction is half an ounce, or more, directed to be prepared in the following manner. Take of powdered Seneca half an ounce, pour on it half a pint of boiling water, after simmering until nearly half reduced, strain, and give a tea spoonful every fifteen minutes, until it puke. To Dr Archer of Maryland, are we indebted for the introduction of this article into general use. He prescribed it sometimes as an Emetic; and under other circumstances as an expectorant.

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The diversity of opinion respecting the value of this article in croup, has been imputed to its indiscriminate use, in every stage of the disease. It must not be administered so long as a preter natural excitement of the system exists. Its good effects depend on its exciting the trachea and lungs, to an increased excretion of those substances which oppress it: hence it is quite obvious, that, if there is much vigour of the circulation and frequency of the pulse, it will not operate by reducing the inflamed surface by the excretion; but by increasing the fever and aggravating all the symptoms. If this medicine purges too freely, its effects must be restrained, by the addition of two or three drops of laudanum every two or three hours. As an Emetic, the tartarized antimony either alone or combined with Ipecacuanha is recommended. It is thought by some to be preferable, as regards certainty of operation, to the Polygala Senega. The bowels should be kept open by clysters, and the strength of the patient supported by more nutritious

food, than is proper in the first stages. As a last resource, the operation of tracheotomy must be performed, or the case abandoned wholly to nature. When the operation is successfully performed, nothing more is accomplished, than the removal of the membrane. If this is very tenacious, it can be easily done. If it is soft and pulpy, a small portion only, can be removed. If by the removal of the membrane, the patient were cured: there would be great inducement to operate. Cases are recorded, where the membrane had been expectorated, and the child died immediately after. If the operation be performed, the operators can promise to the friends of the patient, no more, in ordinary cases than the protraction of life. Should the same predisposition, which existed previous to the formation of this membrane, still exist, the operation will prove feeble and unavailing -

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